

TEST REPORT

Product : SwitchBot Presence Sensor
Trade mark : SwitchBot
Model/Type reference : W8200000, W8200001, W8200002,
W8200003, W8200004, W8200005
Serial Number : N/A
Report Number : EED32R80981802
Date of Issue : Aug. 11, 2025
Test Standards : Article 2 Paragraph 1 of Item 8
MIC Notice No.88 of 2004
Appendix No.22-16(latest version: MIC Notice
No.365 of 2020)
Test method : Temporary test method determined by DSPR:
特定小電力無線局(60GHz 帯 移動体検知センサ
ー)に使用するための無線設備の特性試験方法
Test result : PASS

Prepared for:

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Aug. 11, 2025

Aaron Ma

Check No.:1505160625



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2 Test Summary

Article 2, Paragraph 1, Item 8 Description of Test	Result
Frequency Tolerance	PASS
Occupied Bandwidth	PASS
Antenna Power Tolerance	PASS
Unwanted Emission Strength	PASS
Secondary Radiated Emission Strength	Not Applicable
Transmission time restriction	PASS
Radio Emission Stop Function	PASS
Interference Prevention Function	PASS

Remark:

Not Applicable: EUT has no standalone receiving mode, receivers used in combination with permanently co-located transmitters continuously transmitting.

Model No.: W8200000, W8200001, W8200002, W8200003, W8200004, W8200005

Only the model W8200000 was tested. All model numbers have same electrical, PCB and layout, only the model name are different for marketing requirements.

3 General Information

3.1 Client Information

Applicant:	Woan Technology (Shenzhen) Co., Ltd.
Address of Applicant:	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100
Manufacturer:	Woan Technology (Shenzhen) Co., Ltd.
Address of Manufacturer:	Room 1101, Qiancheng Commercial Center, No. 5 Haicheng Road, Mabu Community, Xixiang Sub-district, Bao'an District, Shenzhen, Guangdong, P.R.China, 518100
Factory:	Wo'an Technology (Shenzhen) Co., Ltd. Huizhou Branch
Address of Factory:	Building 2, 2nd Floor, Baidi Zhigu Science and Technology Innovation Park, No.263 Chang'an Avenue, Shatian Town, Huiyang District, Huizhou City, Guangdong, China

3.2 General Description of EUT

Product Name:	SwitchBot Presence Sensor	
Model No.:	W8200000, W8200001, W8200002, W8200003, W8200004, W8200005	
Test model No.:	W8200000	
Trade Mark:	SwitchBot	
Product Type:	Indoor UWB system	
Operating Frequency range:	60GHz to 62.5GHz	
Modulation Type:	FMCW	
Antenna Type:	Antenna in Package	
Antenna Gain:	7.43 dBi	
Power Supply:	Battery:	DC 3V
Sample Received Date:	Jun. 26, 2025	
Sample tested Date:	Jun. 26, 2025 to Aug. 11, 2025	

3.3 EUT test environment range

Temperature:	0 - 45.0 °C
Humidity:	45 - 85 % RH
Atmospheric Pressure:	1000 - 1010 mbar

3.4 Description of Support Units

The EUT has been tested stand-alone.

1) support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Netbook	Asus	FL8700JP1065-0D8GXYQ2X10	FCC&CE	CTI

3.5 Test Location

All tests were performed at:

Centre Testing International Group Co., Ltd.

Hongwei Industrial Zone, Bao'an 70 District, Shenzhen, Guangdong, China 518101

Telephone: +86 (0) 755 3368 3668 Fax: +86 (0) 755 3368 3385

No tests were sub-contracted.

4 Equipment List

3M full-anechoic Chamber							
Equipment	Manufacturer	Model No.	Serial Number	Cal. Date (mm-dd-yyyy)	Cal. Due date (mm-dd-yyyy)	Calibration body	Classification
Fully Anechoic Chamber	TDK	FAC-3	---	01-09-2024	01-08-2027	CTIMT	(c)
Receiver	Keysight	N9038A	MY57290136	01-04-2025	01-03-2026	CTIMT	(c)
Spectrum Analyzer	Keysight	N9020B	MY57111112	01-14-2025	01-13-2026	CTIMT	(c)
Spectrum Analyzer	Keysight	N9030B	MY57140871	01-14-2025	01-13-2026	CTIMT	(c)
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-1148	04-12-2025	04-11-2026	CTIMT	(c)
Horn Antenna	Schwarzbeck	BBHA 9170	9170-832	04-12-2025	04-11-2026	CTIMT	(c)
Horn Antenna	ETS- LINDGREN	3117	57407	07-03-2024 06-29-2025	07-02-2025 06-28-2026	CTIMT	(c)
Preamplifier	EMCI	EMC001330	980563	03-03-2025	03-02-2026	CTIMT	(c)
Preamplifier	Tonscend	TAP-011858	AP21B806112	07-18-2024 07-07-2025	07-17-2025 07-06-2026	CTIMT	(c)
Preamplifier	Tonscend	EMC051845S E	980380	12-05-2024	12-04-2025	CTIMT	(c)
Communication test set	R&S	CMW500	102898	01-04-2025	01-03-2026	CTIMT	(c)
Temperature/ Humidity Indicator	biaozhi	GM1360	EE1186631	03-31-2025	03-30-2026	CTIMT	(c)
RSE Automatic test software	JS Tonscend	JS36-RSE	V4.0.0.0	---	---	---	---
Cable line	Times	SFT205- NMSM-2.50M	394812-0001	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	SFT205- NMSM-2.50M	394812-0002	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	SFT205- NMSM-2.50M	394812-0003	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	SFT205- NMSM-2.50M	393495-0001	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	EMC104- NMNM-1000	SN160710	01-09-2024	01-08-2027	CTIMT	(c)

Cable line	Times	SFT205- NMSM-3.00M	394813-0001	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	SFT205- NMNM-1.50M	381964-0001	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	SFT205- NMSM-7.00M	394815-0001	01-09-2024	01-08-2027	CTIMT	(c)
Cable line	Times	HF160-KMKM- 3.00M	393493-0001	01-09-2024	01-08-2027	CTIMT	(c)
Spectrum Analyzer	R&S	FSW43	102978	08-12-2024	08-11-2025	CTIMT	(c)
Receive unit (mixer + antenna)	R&S	TC-RSE60 (40-65GHz)	100729	08-25-2024	08-24-2025	R&S	(c)
Receive unit (mixer + antenna)	R&S	TC-RSE90 (57-93GHz)	100721	08-25-2024	08-24-2025	R&S	(c)
Receive unit (mixer + antenna)	R&S	TC-RSE140 (90-140GHz)	101254	08-25-2024	08-24-2025	R&S	(c)

Remark:

- (a) Calibration conducted by the National Institute of Information and Communications Technology (NICT) in Japan (hereinafter referred to as "NICT") or a designated calibration agency under Article 102-18 paragraph (1) in JRL.
- (b) Correction conducted pursuant to the provisions of Article 135 or Article 144 of the Measurement Act (Act No. 51 of 1992).
- (c) Calibration conducted in countries except Japan, which shall be equivalent to the calibration conducted by the NICT or a designated calibration agency under Article 102-18 paragraph (1).
- (d) Calibration, etc. conducted by using measuring instruments and other equipment listed in the right column of appended table No. 3, which shall have been given any type of calibration, etc. listed above from (a) to (c).

From JRL Article 24-2, paragraph 4, Item 2

Notice: Calibration duration for above equipment is 1 year.

5 Radio Technical Requirements Specification

5.1 Transmitter Requirements

5.1.1 EUT test voltage

EUT test voltage		
Power Supply:	DC 3.3V	
Test voltage require:	Supply the rated voltage and the rated voltage $\pm 10\%$ to power supply. However, If the fluctuation of input voltage to the circuit of RF unit (except power supply) of test equipment is under $\pm 1\%$, when input voltage from external power supply to the test equipment is fluctuated by $\pm 10\%$: Conduct the test with the rated voltage only.	
Power Supply result:	The measurement result of the voltage fluctuation at RF circuit when DC 3.7V $\pm 10\%$.	
	DC Input(V)	RF circuit(V)
	3.3V	3.300V
	3V	3.300V
	2.7V	3.300V

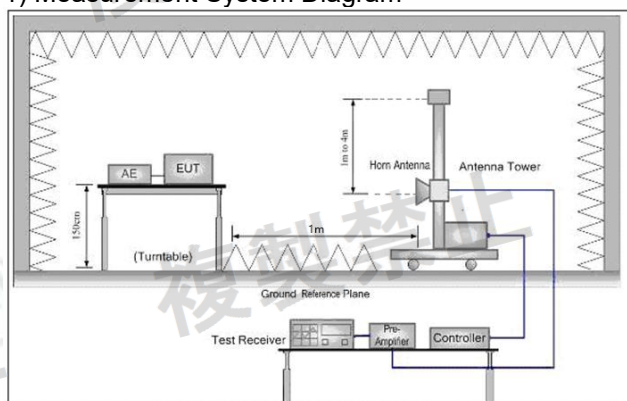
5.1.2 FREQUENCY TOLERANCE

Limit

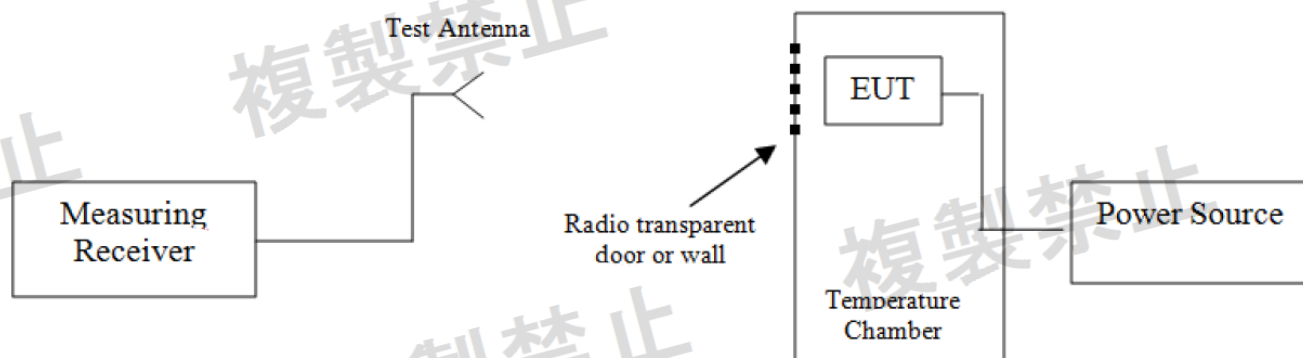
Within the designated frequency band: 57~64 GHz.

Test Procedure

1) Measurement System Diagram



2) Measurement System Diagram (Extreme temperature condition)



3) Spectrum Analyzer Conditions

Span: Wide enough to capture the complete power envelope, including all sidebands

RBW: 1MHz

VBW: 3MHz

Sweep time: Auto, Marker: Marker Off

Log scal: 10dB/Div, Data points: 501points (400 points or more)

Detection: Positive Peak, Sweep mode: Continuous

4) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Turn the turning table around;
5. Wait the trace of spectrum analyzer stabilization, marking as requirements;
6. Capture the trace or recorded the data.
7. Repeat under other environment conditions to measurement.

1. Vibration test:

Set the vibration test system as the table below:

Frequency	ASD(Acceleration Spectral Density) random
From 5Hz to 20Hz	$0.96\text{m}^2/\text{s}^3$
Exceeding 20Hz to 500Hz	-3dB/Octave

Start the vibration test system, Test the frequency tolerance, Record the test result.

2. Temperature test

Place the device to be tested in the temperature and humidity tester in the non-operation state and set the temperature of the temperature and humidity tester to a low temperature while in this condition.

The low temperature is 0°C , -10°C and -20°C , use the minimum value within the range of the specification of the device to be tested.

The high temperature is 40°C , 50°C and 60°C , use the highest value within the range of the specification of the device to be tested.

Leave it in this condition for 1hour.

Apply the prescribed power supply voltage to operate to device to be tested in the temperature and humidity tester.

Test the frequency tolerance, Record the test result.

3. Humidity Test

Place the device to be tested in the temperature and humidity tester in the non-operating state. While this condition remains, set the temperature to 35°C and the relative humidity to 95% or the maximum or the maximum humidity in the specification of the device to be tested in the temperature and humidity tester.

Leave it in this condition for 4 hours.

After this time, the setting of the temperature and humidity tester is changed back to the normal temperature and normal humidity and, after confirming that there is no condensation, operate the device to be tested by applying the prescribed power supply voltage.

Record the test result.

4. Voltage Fluctuation Test

Set the power supply to test voltage, Test the frequency tolerance

Record the test result.

5. Test configuration:

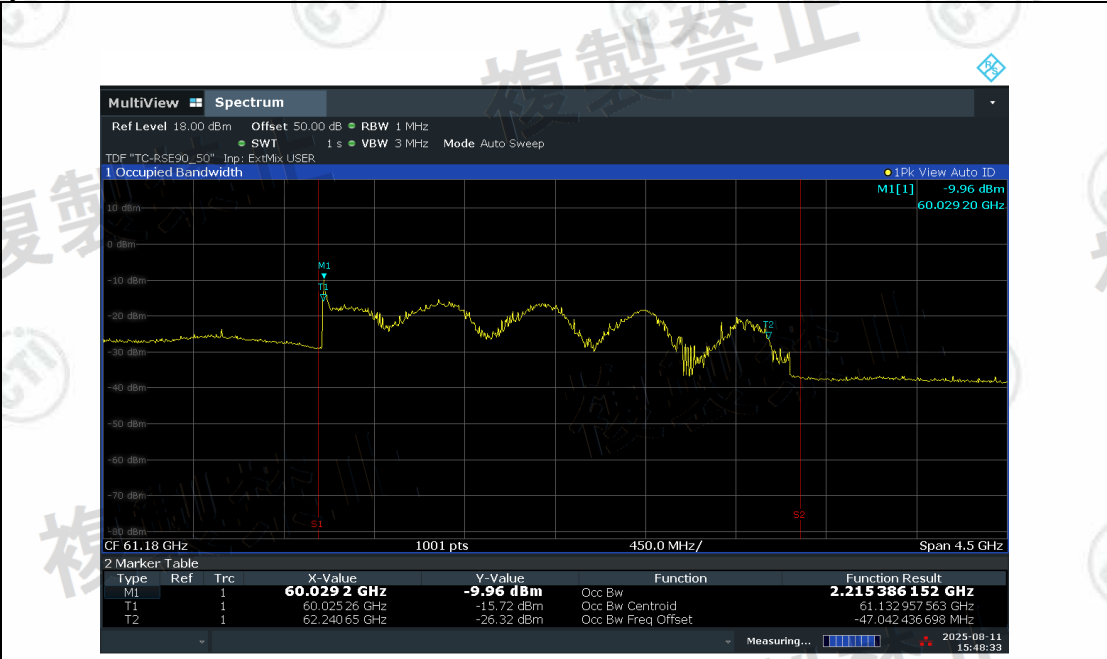
Voltage Fluctuation Test	TC1	Temp: 25°C	3.0VDC
	TC2		2.7VDC
	TC3		3.3VDC
Environment Test	TC4	Voltage: 3.0VDC	Low Temp: 0°C
	TC5		High Temp: 45°C
	TC6	Voltage: 3.0VDC; Temp:35°C	Humidity: 95%
Vibration Test	TC7	Voltage: 3.0VDC; Temp:25°C	Amplitude: 1mm
	TC8		Amplitude: 3mm

Test Data

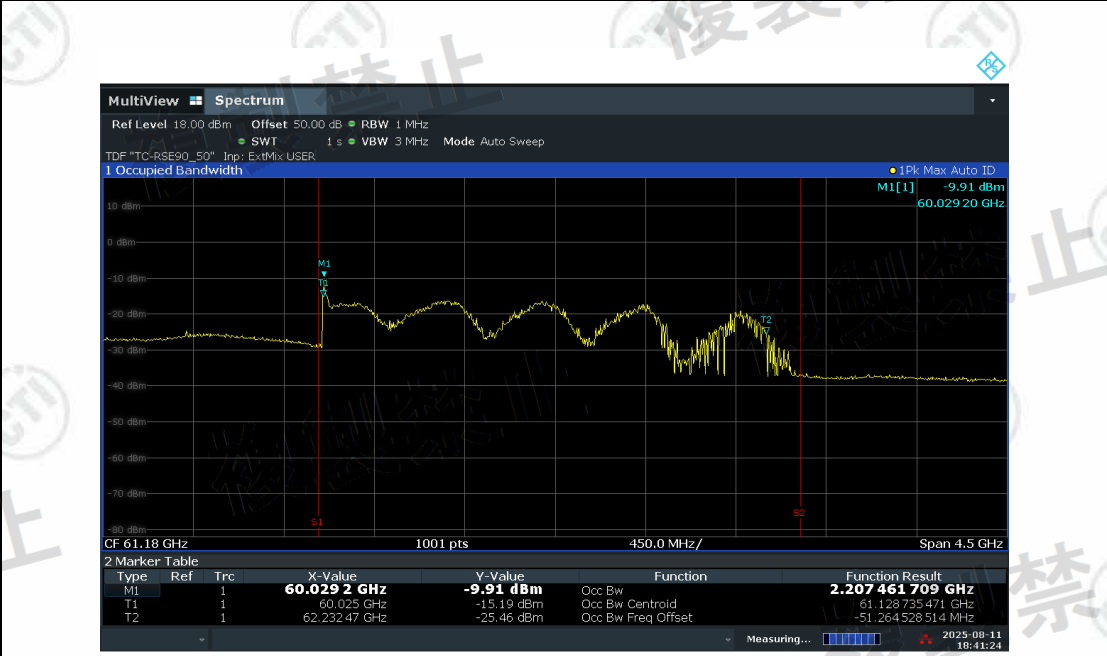
Test Mode: Transmitting

Test Mode	Antenna	Test Condition	FL[GHz]	FH[GHz]	FL Limit [GHz]	FH Limit [GHz]	Verdict
60GHz	Ant1	NVNT	60.0253	62.2407	57	64	PASS
		Humidity:95%	60.0250	62.2325	57	64	PASS
		NVLT	60.0245	62.2161	57	64	PASS
		NVHT	60.0249	62.2463	57	64	PASS
		Amplitude:1mm	60.0252	62.2421	57	64	PASS
		Amplitude:3mm	60.0253	62.2444	57	64	PASS

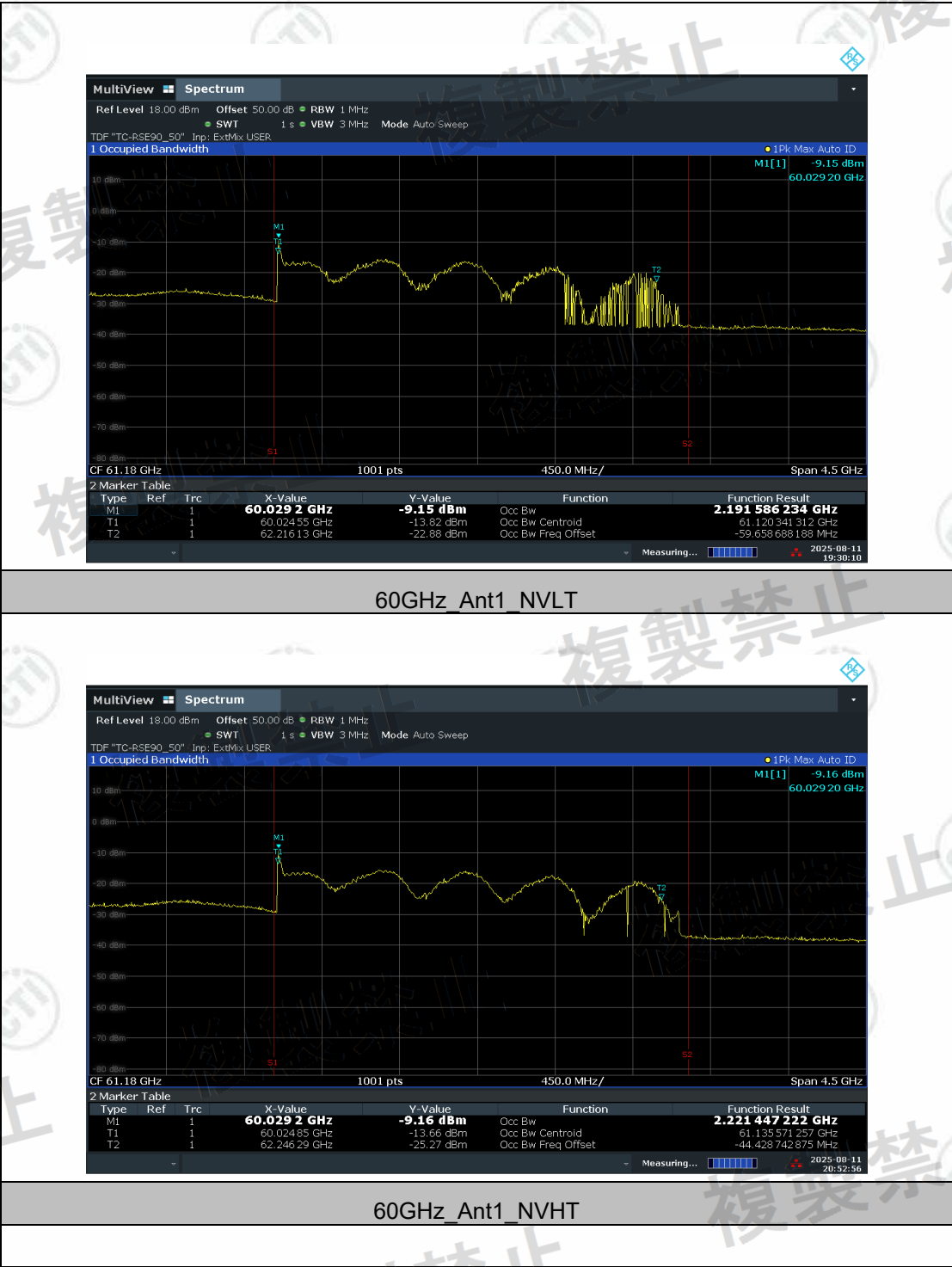
Test Graphs

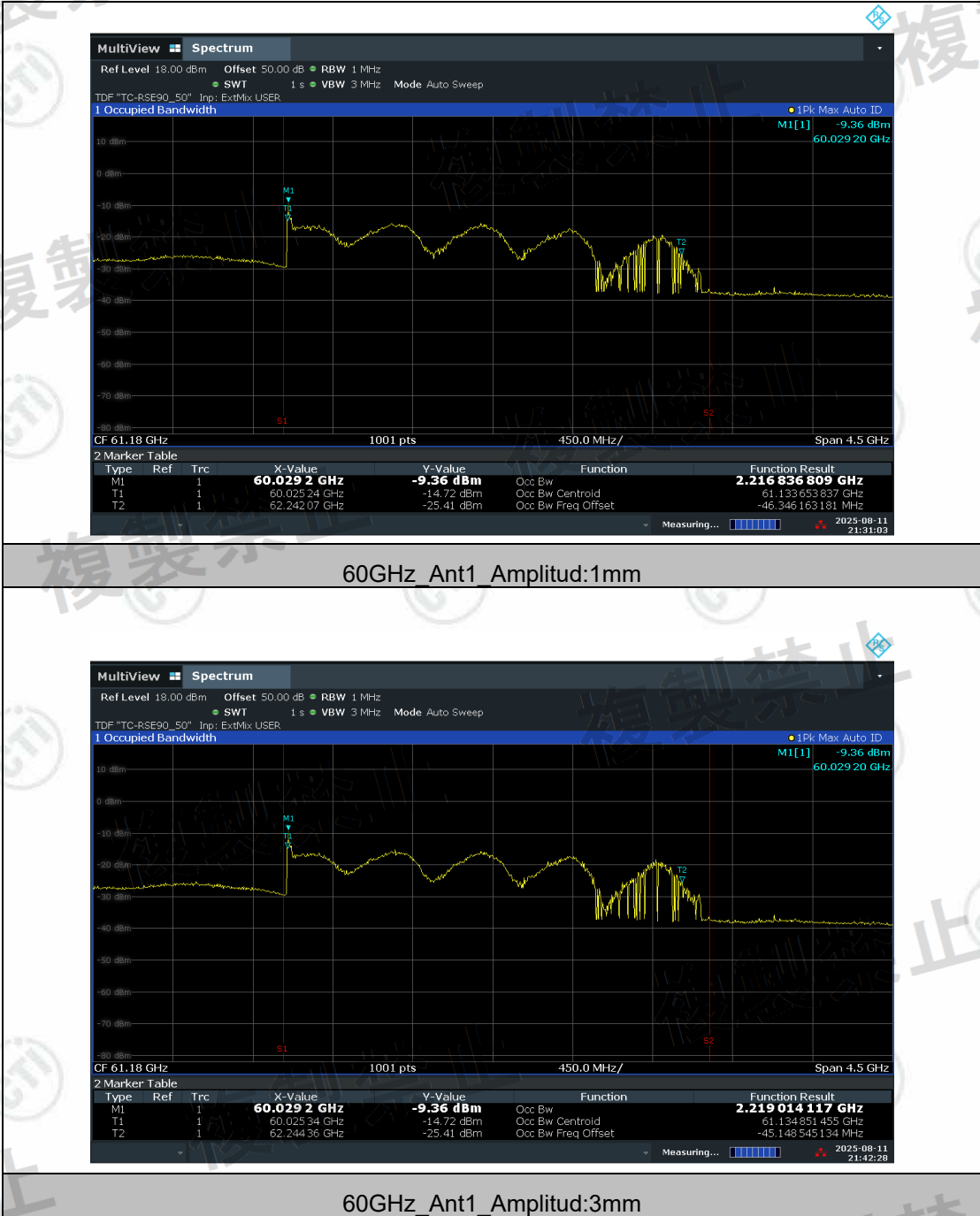


60GHz Ant1_NVNT



60GHz Ant1_Humidity:95%





Note: extreme voltage was declared by manufacture.

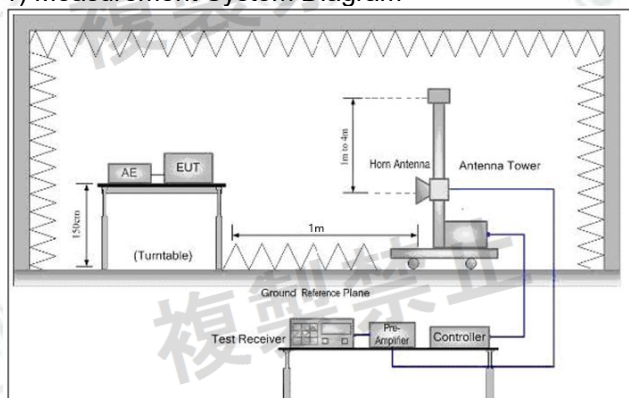
5.1.3 OCCUPIED BANDWIDTH

Limit

Occupied bandwidth: 7 GHz

Test Procedure

1) Measurement System Diagram



2) Spectrum Analyzer Conditions

Span: Wide enough to capture the complete power envelope, including all sidebands

RBW: 1MHz

VBW: 3MHz

Sweep time: Auto, Marker: Marker Off

Log scal : 10dB/Div, Data points : 501points (400 points or more)

Detection: Positive Peak, Sweep mode: Continuous

3) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Turn the turning table around;
5. Wait the trace of spectrum analyzer stabilization, marking as requirements;
6. Capture the trace or recorded the data.
7. Repeat under other voltage conditions to measurement.

Test Data

Test Mode	Antenna	Test Condition	Low Frequency [GHz]	Hight Frequency [GHz]	Measured [MHz]	Limit[MHz]	Verdict
60GHz	Ant1	NVNT	60.02526	62.24065	2215.386	7000	PASS

Test Graphs



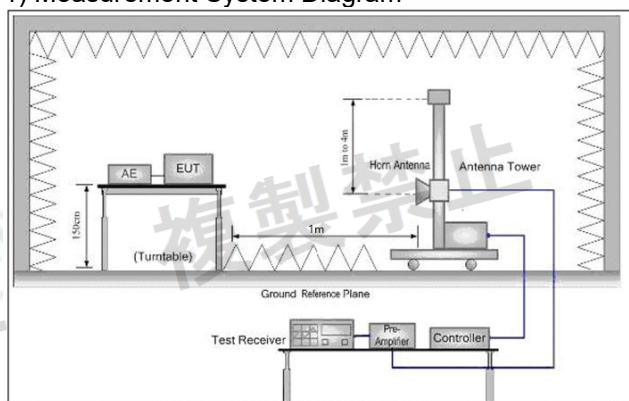
5.1.4 OUTPUT POWER AND OUTPUT POWER TOLERANCE

Limit

- The output power should 10mW or less (Peak).
- The Output Power Tolerance must be within +50%, -70%.
- EIRP should 13dBm or less.

Test Procedure

1) Measurement System Diagram



2) Spectrum Analyzer Conditions

Frequency Center: Frequency to measure
RBW : 1MHz
VBW : 3MHz
Sweep Mode: continues Sweep
Detection: Peak
Log scale : 10dB/Div, Data points : 501points (400 points or more)
Reference level : Enough level for maximum dynamic range

3) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Turn the turning table around;
5. Wait the trace of spectrum analyzer stabilization, marking as requirements;
6. Capture the trace or recorded the data.
7. Repeat under other voltage conditions to measurement.

Test Data

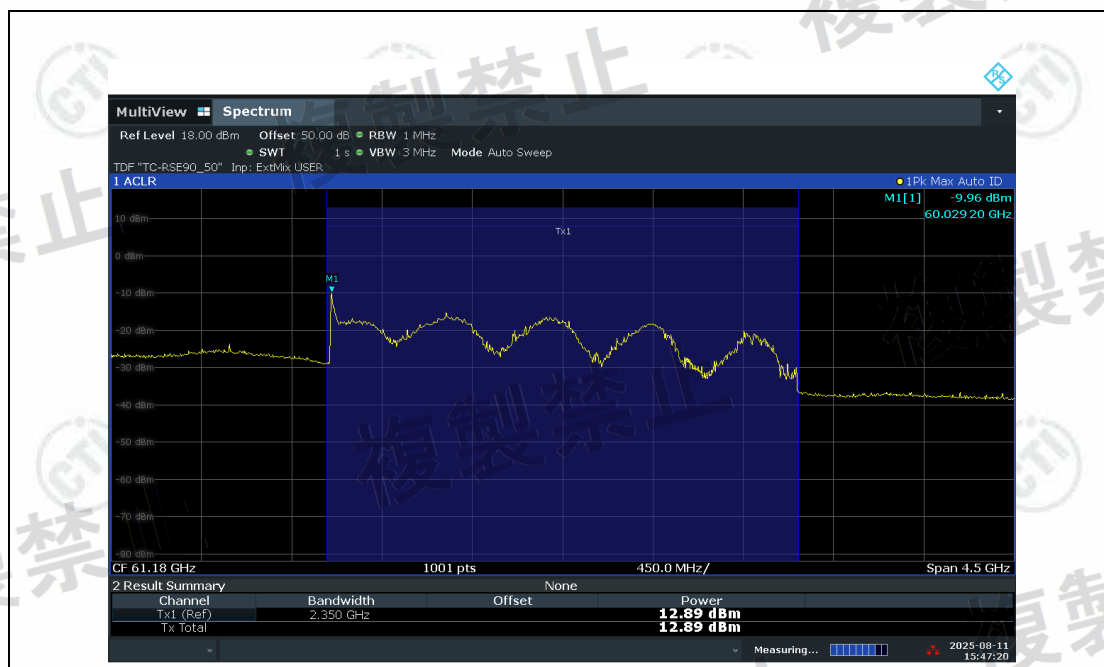
EIRP					
Test Condition	Test Mode	Antenna	Result(dBm)	Limit (mW)	Verdict
NTNV	60GHz	Ant1	12.89	≤13	PASS

Test Condition	Test Mode	Antenna	Antenna Power(dBm)	Antenna Power(mW)	Limit [mW]	Verdict
NTNV	60GHz	Ant1	5.46	3.516	10	PASS

Note: Antenna Power = EIRP - Antenna Gain

Tolerance							
Test Condition	Test Mode	Antenna	Power (mW)	Rated Power (mW)	Result (%)	Limit (%)	Verdict
NTNV	60GHz	Ant1	3.516	3.5	+0.05	-70 to +50	PASS

Test Graphs



5.1.5 UNWANTED EMISSION STRENGTH

Limit

55.62GHz or less: -30dBm/MHz or less

Over 55.62GHz, 67.5GHz or less: -26dBm/MHz or less (except designated frequency band)

Over 67.5GHz: -30dBm/MHz or less

Test Procedure

1) Measurement System Diagram

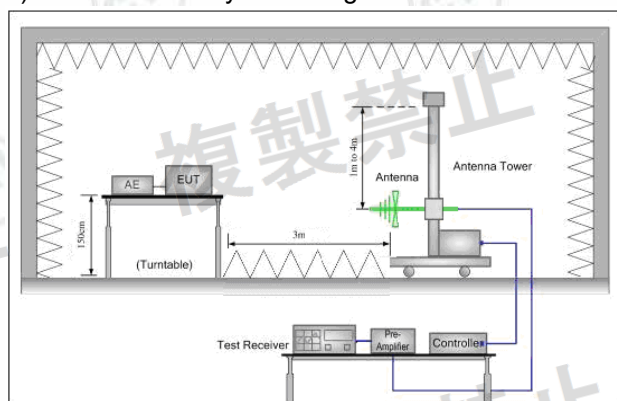


Figure 1. 30MHz to 1GHz

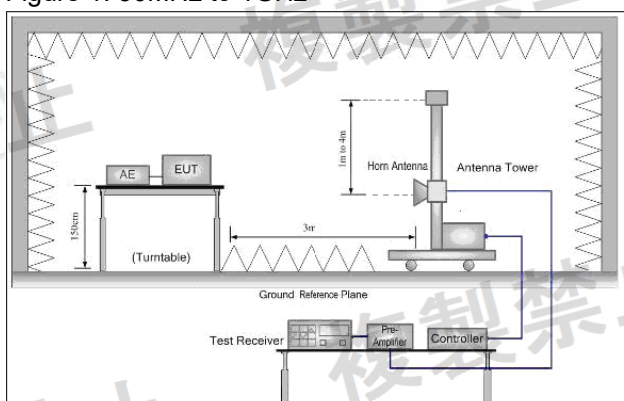


Figure 2. 1GHz to 40GHz

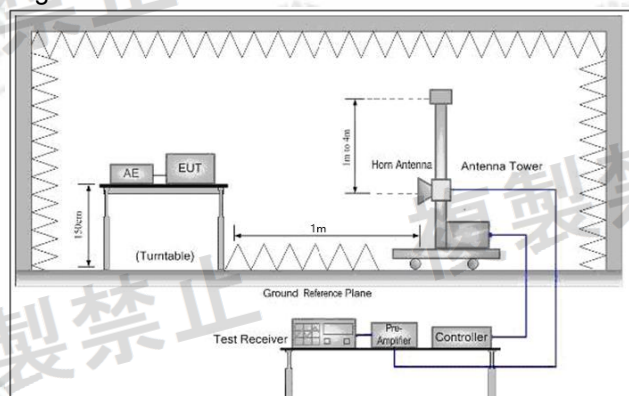


Figure 3. Above 40GHz

2) Spectrum Analyzer Conditions

Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the power of spurious emission.

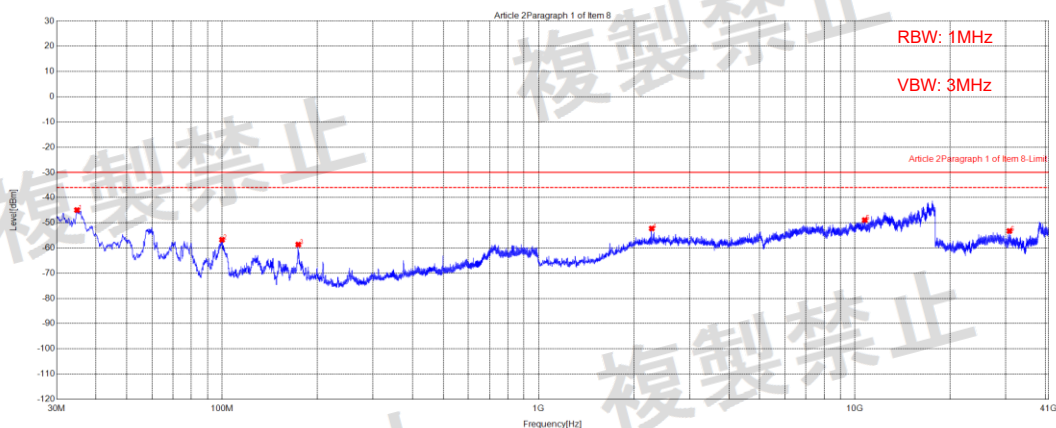
3) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Turn the turning table around;
5. Wait the trace of spectrum analyzer stabilization, marking as requirements;
6. Capture the trace or recorded the data.
7. Repeat under other voltage conditions to measurement.

Test Data

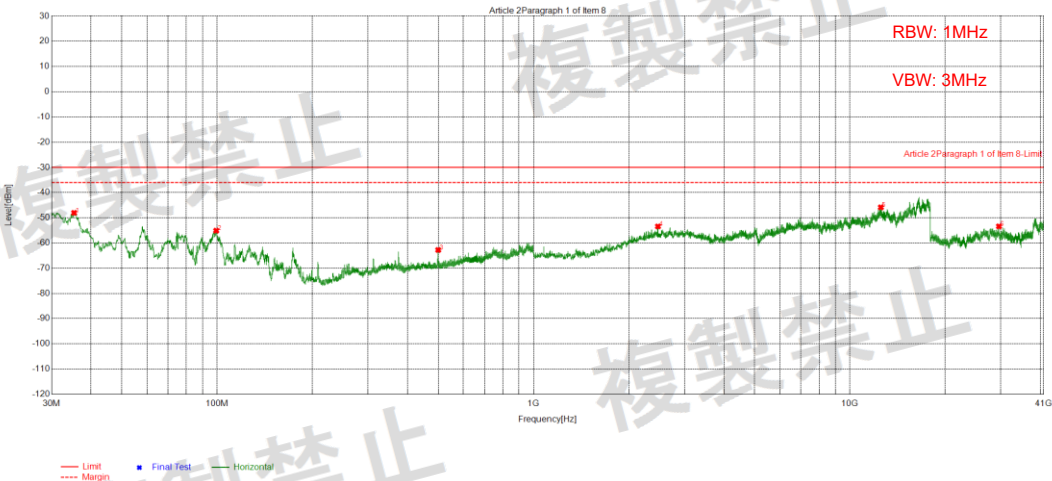
Test Mode: Transmitting

30MHz-41GHz



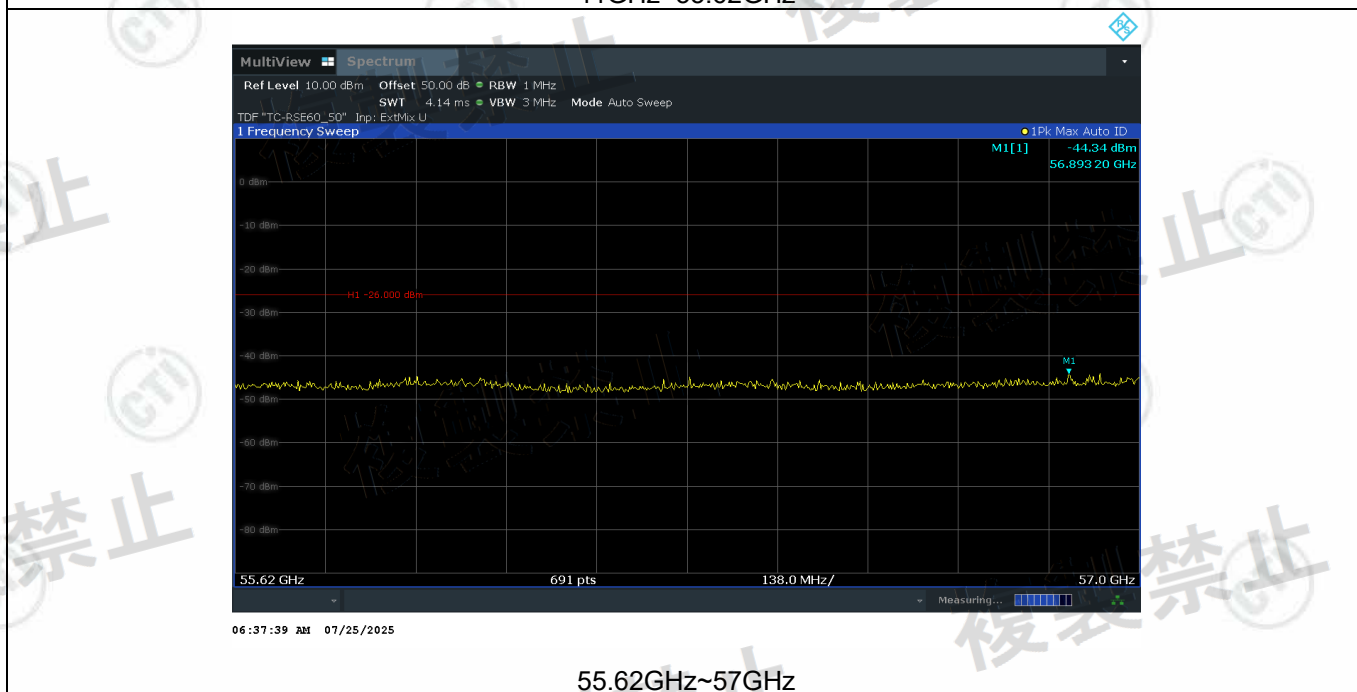
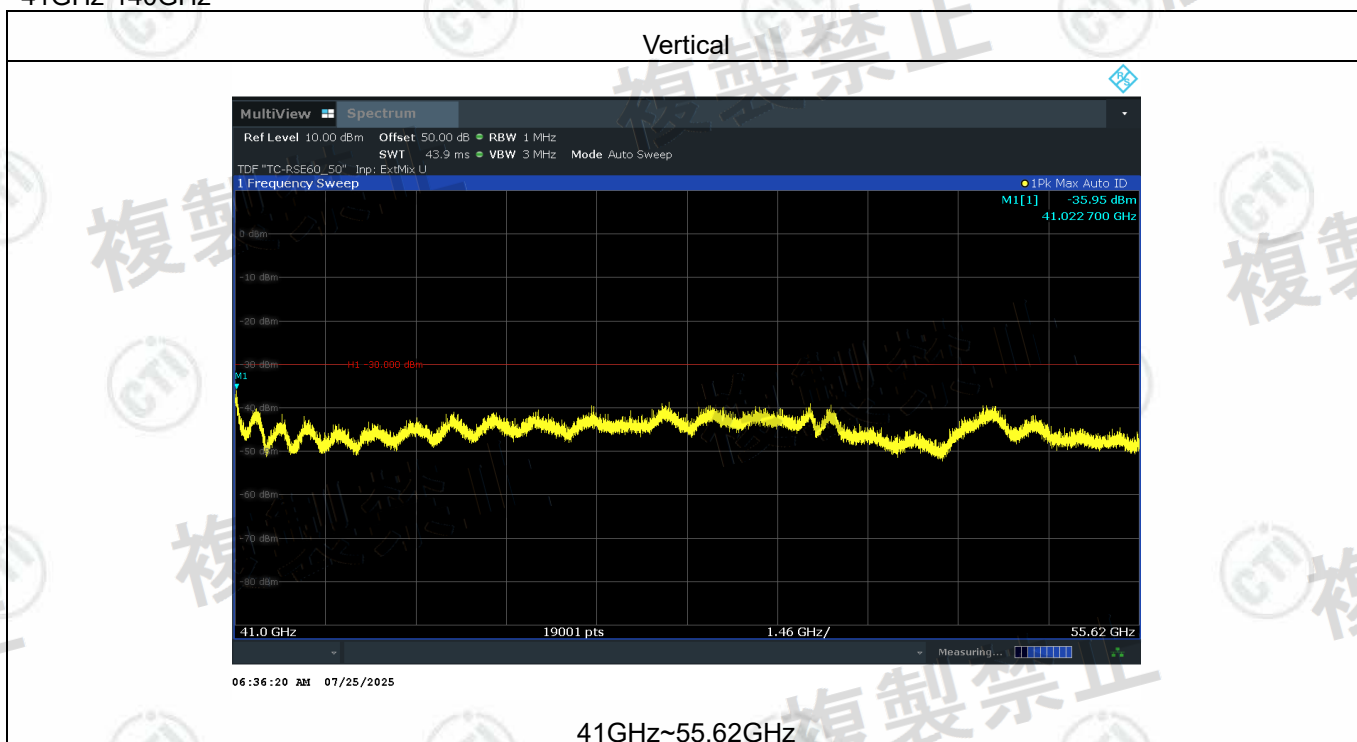
Suspected List								
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	34.8017	150	226	-44.95	-30.00	14.95	PASS	Vertical
2	99.989	150	318	-56.72	-30.00	26.72	PASS	Vertical
3	174.1492	150	360	-58.63	-30.00	28.63	PASS	Vertical
4	2280.228	150	78	-52.27	-30.00	22.27	PASS	Vertical
5	10745.3745	150	133	-48.92	-30.00	18.92	PASS	Vertical
6	30791.5792	150	50	-53.26	-30.00	23.26	PASS	Vertical

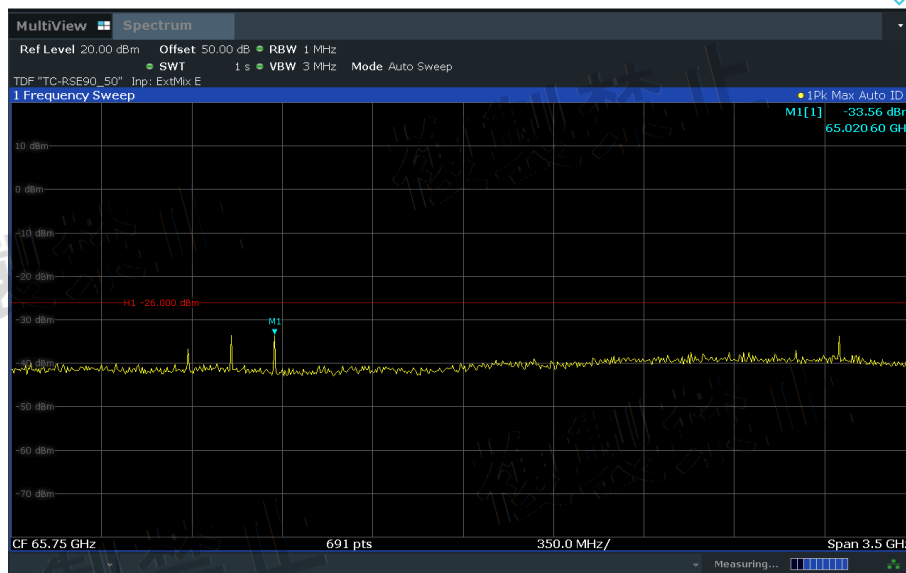
30MHz-41GHz



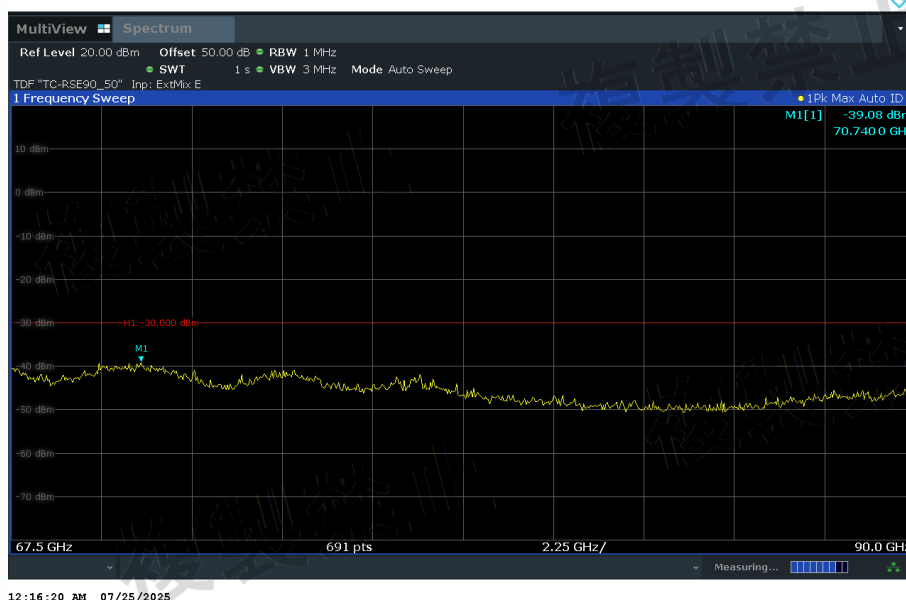
Suspected List								
NO.	Freq. [MHz]	Height [cm]	Azimuth [deg]	Level [dBm]	Limit [dBm]	Margin [dB]	Result	Polarity
1	35.3353	150	235	-48.03	-30.00	18.03	PASS	Horizontal
2	99.407	150	319	-55.10	-30.00	25.10	PASS	Horizontal
3	499.9885	150	68	-62.77	-30.00	32.77	PASS	Horizontal
4	2474.0474	150	105	-53.43	-30.00	23.43	PASS	Horizontal
5	12528.8529	150	22	-45.85	-30.00	15.85	PASS	Horizontal
6	29590.8591	150	263	-53.40	-30.00	23.40	PASS	Horizontal

41GHz~140GHz

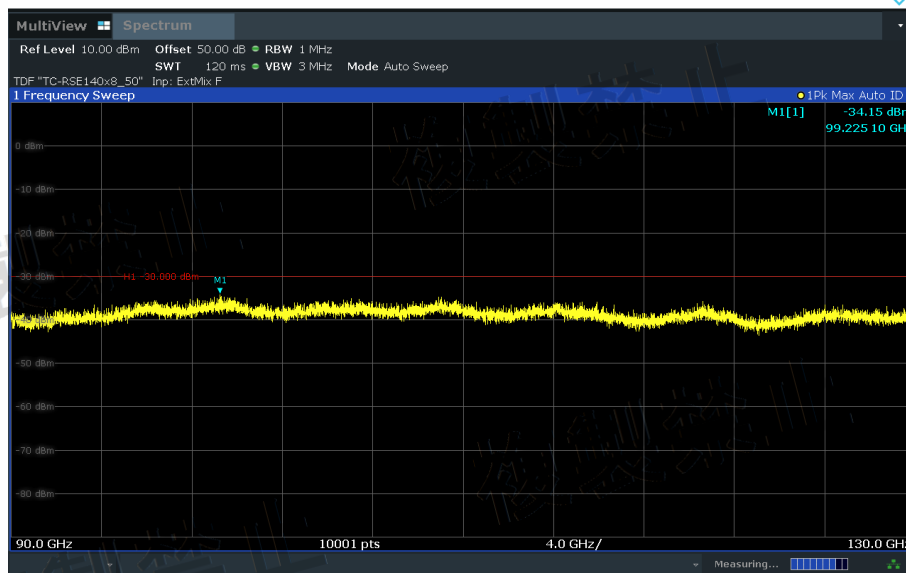




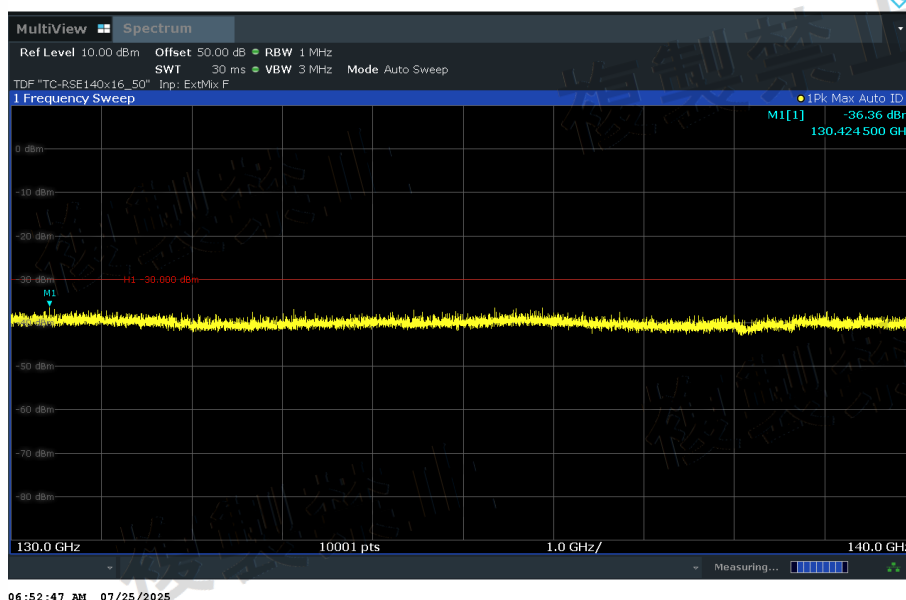
64GHz~67.5GHz



67.5GHz~90GHz

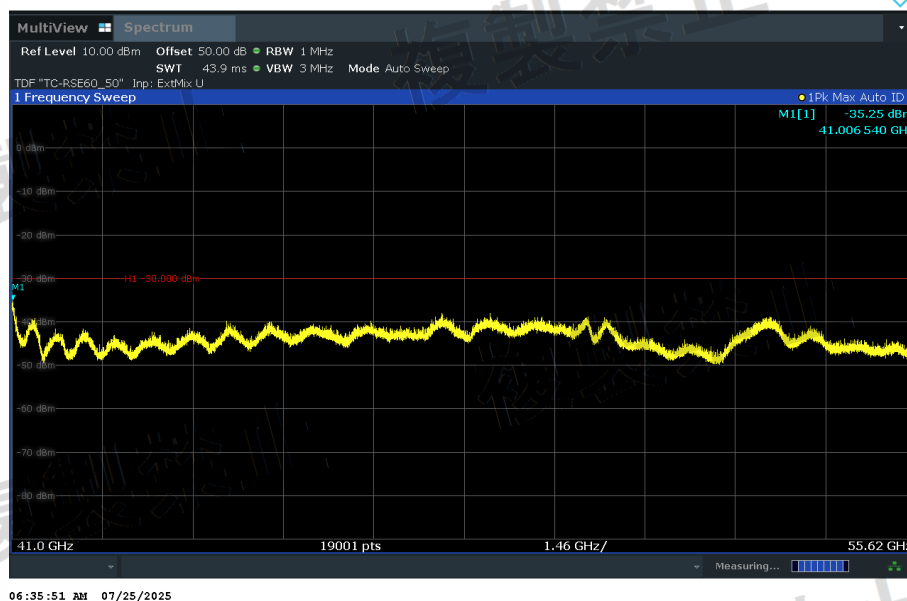


90GHz~130GHz

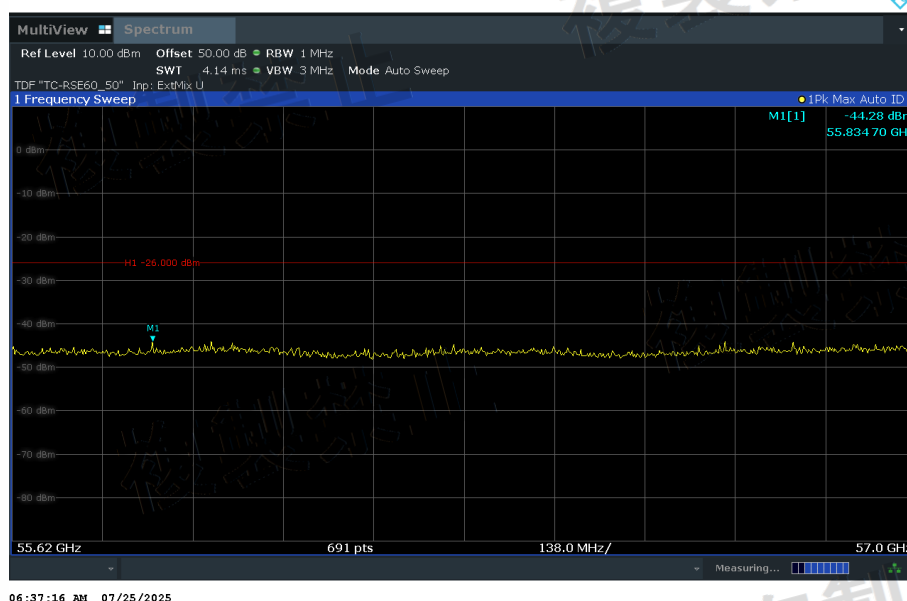


130GHz~140GHz

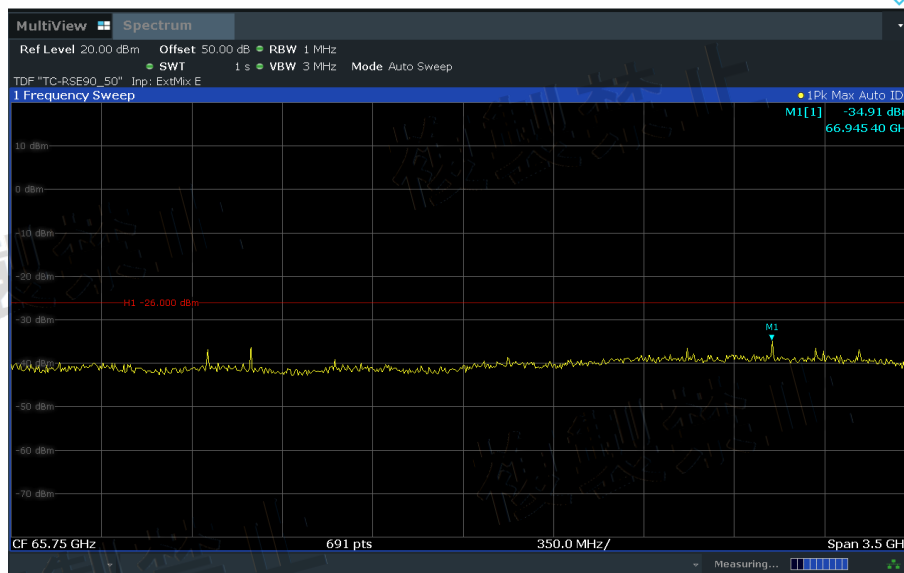
Horizontal



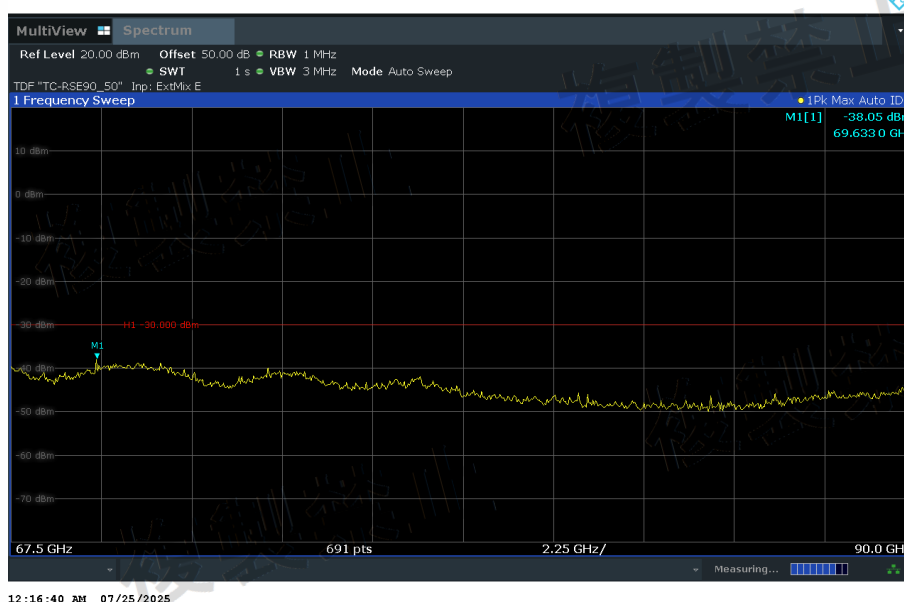
41GHz~55.62GHz



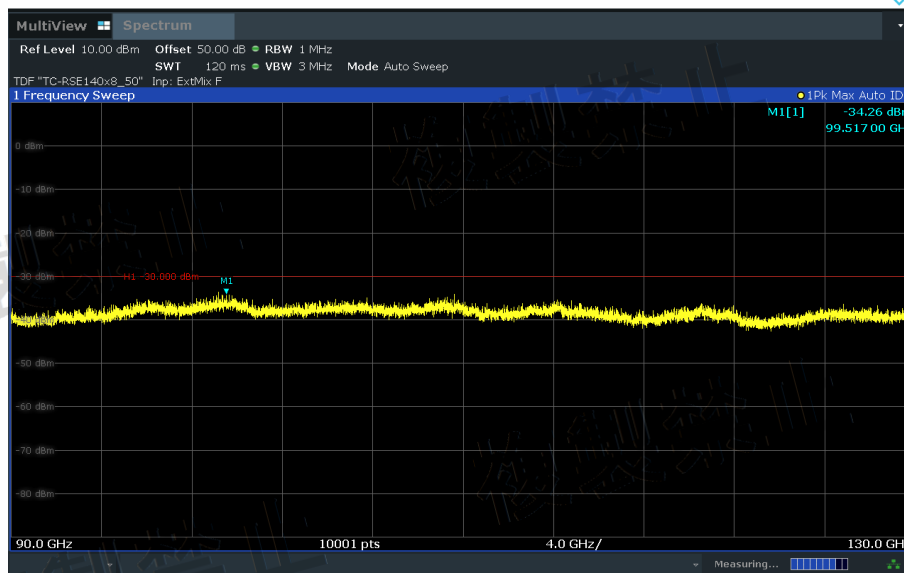
55.62GHz~57GHz



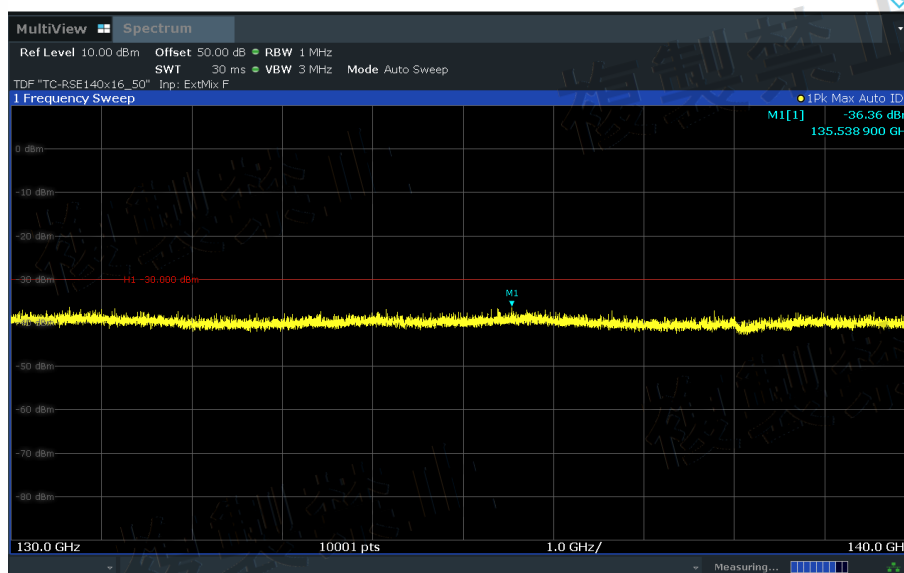
64GHz~67.5GHz



67.5GHz~90GHz



90GHz~130GHz



130GHz~140GHz

5.1.6 SECONDARY RADIATED EMISSION STRENGTH

Limit

55.62GHz or less: -30dBm/MHz or less

Over 55.62GHz, 67.5GHz or less: -26dBm/MHz or less (except designated frequency band) Over 67.5GHz: -30dBm/MHz or less

Test Procedure

1) Measurement System Diagram

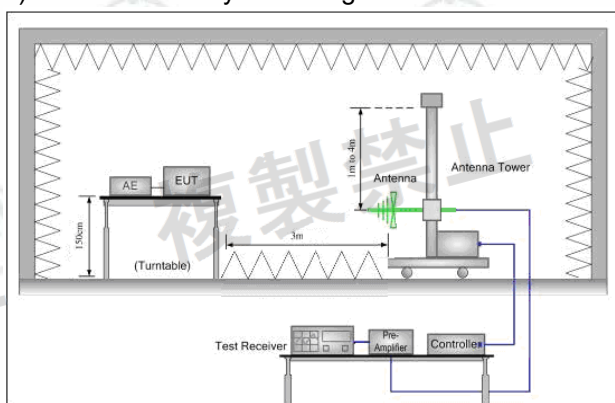


Figure 1. 30MHz to 1GHz

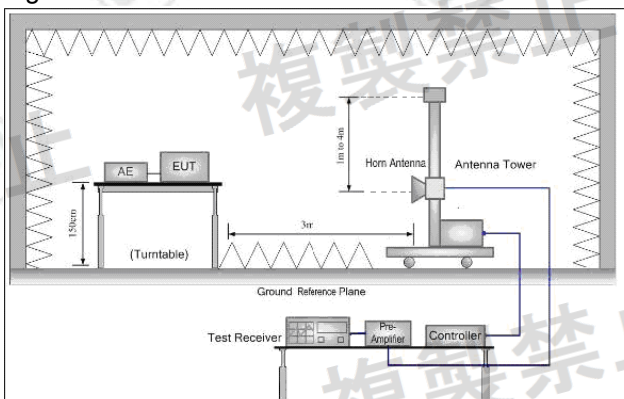


Figure 2. 1GHz to 40GHz

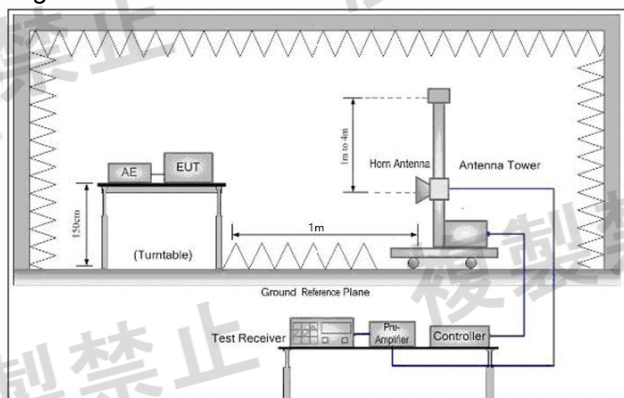


Figure 3. Above 40GHz

2) Spectrum Analyzer Conditions

Sweep the spectrum analyser (or equivalent equipment) over a frequency range and measure the power of spurious emission.

3) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Turn the turning table around;
5. Wait the trace of spectrum analyzer stabilization, marking as requirements;
6. Capture the trace or recorded the data.
7. Repeat under other voltage conditions to measurement.

Test Data

Test Result: N/A.

EUT has no standalone receiving mode, receivers used in combination with permanently co-located transmitters continuously transmitting.

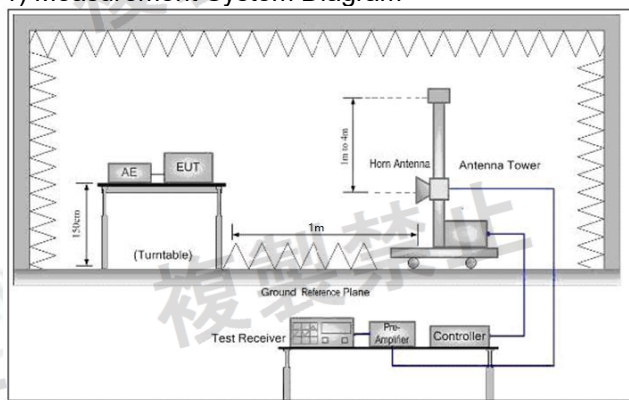
5.1.7 TRANSMISSION TIME RESTRICTION

Limit

3.3ms or less per 33ms

Test Procedure

1) Measurement System Diagram



2) Spectrum Analyzer Conditions

Span: 0Hz

RBW: 8MHz

VBW: 8MHz

Sweep time: Wide enough to capture the complete duty cycle

Log scal : 10dB/Div, Data points : 501points (400 points or more)

Detection: Positive Peak, Sweep mode: Single

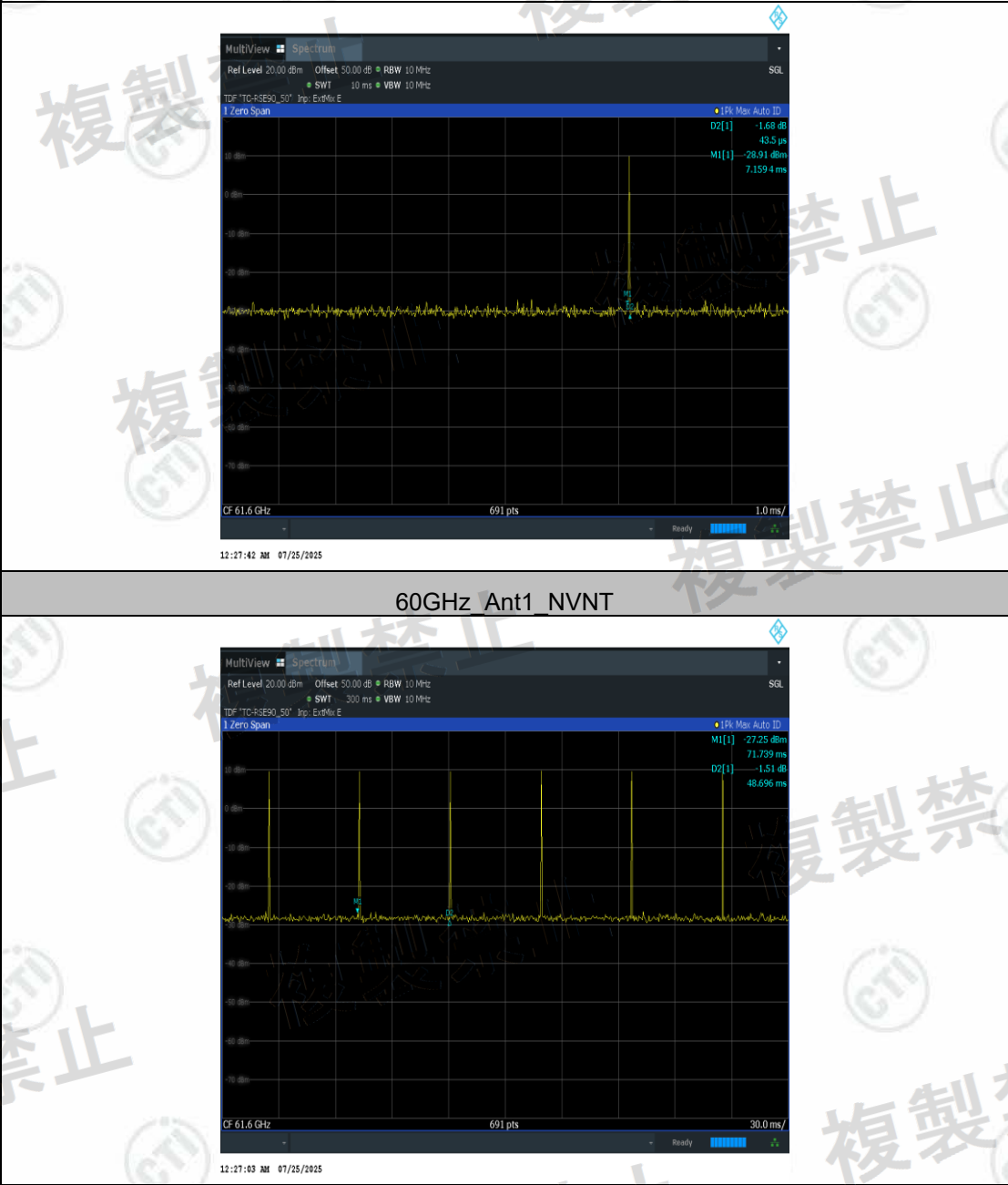
3) Test Procedure

1. EUT and measurement system setup as Measurement System Diagram;
2. Spectrum analyzer setup as Spectrum Condition;
3. EUT was set into operating mode;
4. Wait the trace of spectrum analyzer stabilization, marking as requirements;
5. Capture the trace or recorded the data.

Test Data

Tolerance						
Test Condition	Test Mode	Antenn a	Observation Time(ms)	Transmitter On (ms)	Limit	Verdict
NTNV	60GHz	Ant1	33	0.0435	<3.3ms per 33ms	PASS

Test Graphs



5.1.8 AUTOMATIC STOP FUNCTION RADIO WAVES

Limit

It shall have a function to stop the emission of radio waves except during measurement.

Confirmation Result

Compliant, the EUT can stop the emission controlled by software program.

5.1.9 INTERFERENCE PREVENTION FUNCTION

Requirement

The EUT shall have the interference prevention capability to transmit or to receive the identification automatically, so that sender and receiver shall exclude other equipment.

Confirmation Result

Compliant, the EUT worked as usual, no Identification error occurred, the EUT can identify other radio station(s).

5.1.10 STRUCTURAL REQUIREMENT

Requirement

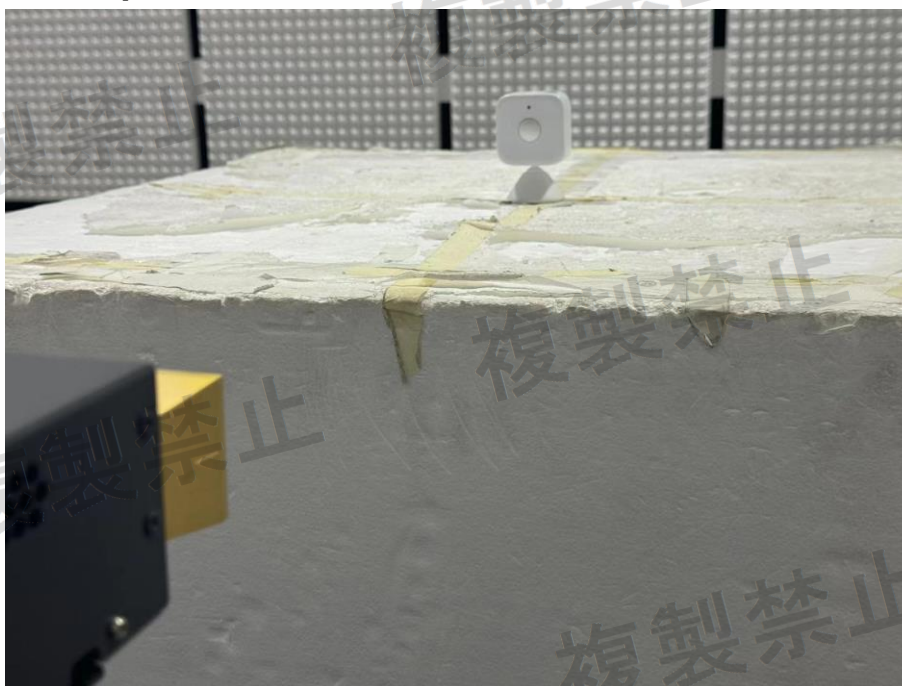
The high-frequency section and modulation section shall be in the housing, and the housing shall not be capable of being opened easily.

Confirmation Result

Compliant, the outer shell of this product is welded using ultrasonic technology and cannot be easily opened.

6 Photographs

6.1 EUT Test Setup



EUT Test Setup-1

6.2 EUT Constructional Details

Refer to Report No. EED32R80981801 for EUT external and internal photos

Statement

1. This report is considered invalid without approved signature, special seal and the seal on the perforation;
2. The Company Name shown on Report and Address, the sample(s) and sample information was/were provided by the applicant who should be responsible for the authenticity which CTI hasn't verified;
3. The result(s) shown in this report refer(s) only to the sample(s) tested;
4. Unless otherwise stated, the decision rule for conformity reporting is based on Binary Statement for Simple Acceptance Rule stated in ILAC-G8:09/2019/CNAS-GL015:2022;
5. Without written approval of CTI, this report can't be reproduced except in full;

*** End of Report ***